Space Weather Forecast

Issued on Friday, 03 March 2023 at 01:23 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

Space Weather Forecast Headline: Likelihood of Moderate flares, with slight chance of Strong activity. Isolated G1/Minor Storms intervals likely days 3 and 4.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Moderate, with a Moderate class flare peaking at 02/2115 UTC from the largest and most complex region on the disc. There are five other numbered sunspot regions on the visible disc, plus three unnumbered regions, and most are small, weak, magnetically simple and are either stable or slowly decaying. However, one new region near the northeast limb is currently the second largest and may prove to have a complex magnetic structure once the region rotates further onto the visible disc and so is easier to analyse.
A filament eruption occurred in the afternoon, starting around 02/1630 UTC and this generated a Coronal Mass Ejection (CME), which is currently thought unlikely to be Earth directed. The Moderate class flare also produced a CME, which has slightly more potential to be Earth directed. Analysis will be undertaken of both CME's once imagery becomes available.

Solar Wind / Geomagnetic Activity: Solar wind speeds have shown waning coronal hole fast wind effects for much of the day, with a new slightly enhancement then arriving from late afternoon. The solar wind was at slightly elevated to elevated levels, generally between 460-530 km/s, peaking at 561 km/s at 02/0133 UTC. Total Interplanetary Magnetic Field was weak, but increased to moderate levels later in the afternoon and evening. The north-south component varying weakly, but with a prolonged period of becoming weakly south from late afternoon. Geomagnetic activity was Quiet, then increased Active to end the day.

Energetic Particles / Solar Radiation: The count rate of energetic particles is at background levels, with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Low to Moderate activity is expected with a slight chance of Strong activity, mainly from the large and complex region in the northwest quadrant. However, new regions are expected to rotate on from the far side, potentially increasing the chance of significant flares.
Solar Wind / Geomagnetic Activity: No Earth directed CMEs are currently forecast, although analysis will be undertaken of the two CME's that occurred on the 2nd. Coronal hole influence is expected to persist through the forecast period, with solar wind speeds likely to be elevated or strong for much of the time. Geomagnetic activity is expected to be Unsettled to Active at first and then generally through days 3 and 4 (5th and 6th) with isolated G1/Minor Storm intervals likely through Days 3 and 4. Temporary Quiet to Unsettled conditions are likely to occur later today and during day 2 (4th).

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

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Energetic Particles / Solar Radiation: The count rate of energetic protons is at background levels with a slight chance of further enhancements. These are most likely to be due to any flares from the large sunspot in the northwest.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	30	20	50	50
Strong	G3	No	1	1	5	5
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	50	50	50	50
Very Active	R3 to R5 X	No	15	15	15	15

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	10	10
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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